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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/003,490	11/01/2001	Francois Serge Nicolas	15-XZ-5547	7319

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Joseph M. Barich  
McAndrews, Held & Malloy, Ltd.  
34th Floor  
500 W. Madison Street  
Chicago, IL 60661

EXAMINER

THOMAS, COURTNEY D

ART UNIT PAPER NUMBER

2882

DATE MAILED: 03/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/003,490

Applicant(s)

NICOLAS ET AL.

Examiner

Courtney Thomas

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 01 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 June 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

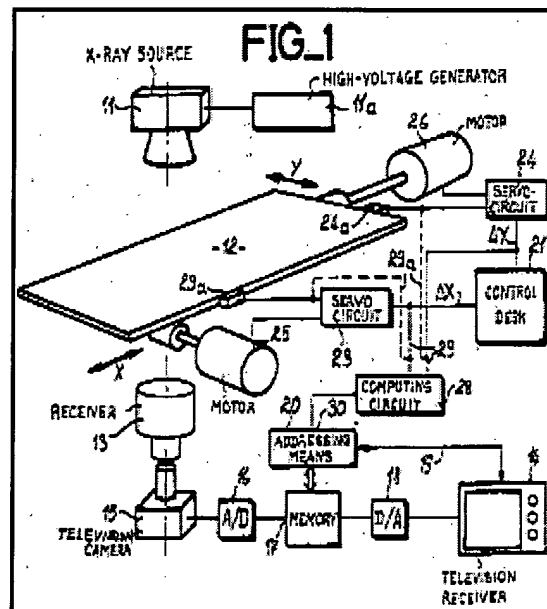
## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-16, 18-29 and 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klausz (U.S. Patent 4,633,494).



3.

[57]

**ABSTRACT**

**A method and apparatus for positioning a patient with respect to an X-ray installation. An X-ray image is produced at the beginning of the operation and stored in an image memory. The memory is read in order to visualize the X-ray image on a television receiver. The table is displaced to a desired position, and the image in the receiver is decentered so as to reproduce the image that would be observed if an X-ray were taken at the desired position.**

4.

Figure 1 and Abstract - U.S. Patent 4,633,494 to Klausz

5. As per claims 1, 18 and 31, Klausz discloses a method comprising the steps of a) positioning a patient between an X-ray emitter and X-ray detector, b) imaging the patient to determine an image, c) analyzing the image to determine positioning of the patient relative to the X-ray emitter and X-ray detector, d) adjusting the positioning of the patient relative to at least one of the X-ray emitter and X-ray detector and e) imaging the patient (see abstract, column1, column 2 lines 1-47). Klausz does not explicitly disclose however, a method wherein imaging the patient (in step b) utilizes a low dose pre-shot, and subsequently imaging the patient (in step e) with a full dose exposure.

6. It would have been obvious to modify the method of Klausz such that it incorporated the step of imaging a patient with a low dose pre shot and subsequently with a full dose exposure. One would have been motivated to make such a modification so that the position determining steps do not sufficiently add to the total radiation exposure experienced by a patient, since it is commonly understood that elevated levels of radiation exposure are capable of causing significant cellular damage in living tissue. The use of a full or regular imaging dose is applied so that the generated image is of high quality, distinctly highlighting contrasts of the internal structure of a patient.

7. As per claims 2, 19, Klausz as modified, does not explicitly disclose a method wherein the adjusting step (step d above) includes adjusting the positioning of the patient and then re-imaging the patient with a second low dose pre-shot prior to imaging the patient with a full dose.

8. It would have been obvious to modify the method of Klausz such that it incorporated the aforementioned limitation. One would have been motivated to make such a modification so that an operator could verify the intended position of a patient prior to imaging as suggested by Klausz (see abstract above).

9. As per claims 3-6 and 20, Klausz as modified, does not explicitly disclose a method wherein low dose pre shots are defined and wherein the imaging parameters are varied between low dose pre-shot and full dose exposure and varied according to patient size and anatomical view.

10. It would have been obvious to modify the method of Klausz such that it incorporated the step of defining low dose pre-shots and full exposure and wherein the imaging parameters are varied between low dose pre-shot and full dose exposure. One would have been motivated to make such a modification so that exposure levels can be adjusted to limit the total radiation exposure experienced by a patient. Additionally, it would have been obvious to further modify the disclosed method so that the imaging parameters are selectively alterable between low dose and full exposure so that generated images can be used for either positioning or internal analysis purposes. It is commonly understood that full or regular imaging doses are varied with respect to the intended imaging areas (i.e. thorax vs. abdominal) so that generated images are of high quality, enabling easy identification of elements within the internal structure of a patient.

11. As per claims 7-10 and 21-23, Klausz as modified does not explicitly disclose a method wherein a) the system is controlled by a technician from a remote acquisition console b) the system is controlled automatically and c) wherein low dose pre-shots generate images within one and five seconds.

12. It would have been obvious to further modify the method of Klausz such that it incorporated the above limitations. One would have been motivated to make such a modification so that a technician is not exposed to radiation as the system is operated. Additionally, it would have been obvious to modify the method so that the system is capable of automatically carrying out a series of image generations, thereby reducing examination time and radiation exposure to the patient.

13. As per claims 11-16 and 24-29, Klausz as modified does not explicitly disclose a method wherein imaging includes imaging a patient with a low dose X-ray imaging sequence, wherein frames occur at a rate of at least 5 frames per second and the sequences are sub-sampled prior to processing.

14. It would have been obvious to further modify the method of Klausz such that it incorporated the above limitations. One would have been motivated to make such a modification so that the system is configured to acquire multiple images of a patient in which ideal positioning can be determined. A benefit of achieving high frame rates, such as that of at least 5 frames per second is that initial patient setups can be accomplished in a short amount of time thereby reducing the total examination time experienced by a patient. Additionally, it would have been obvious to modify the disclosed method so that multiple image data are collected and optimally arranged, so that system components do not experience "slow down" during processing, due to

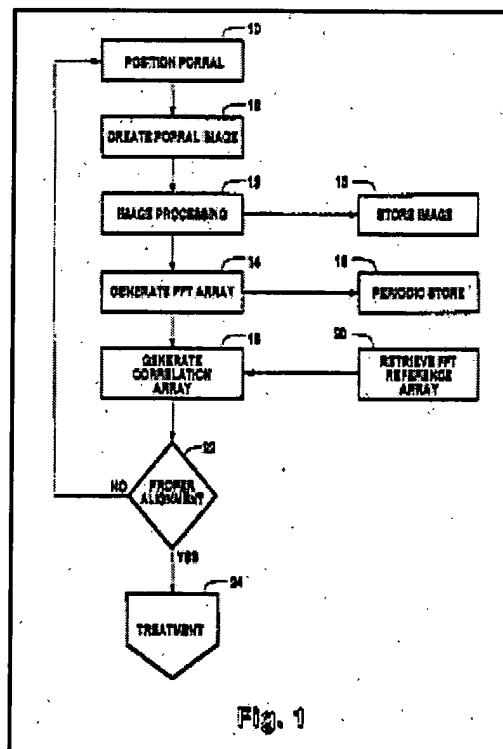
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the large amount of information contained in obtained image sets. A benefit of such a modification is that it assists in reducing examination time by enabling data to be quickly analyzed.

15. As per claims 32-35, Klausz as modified does not explicitly disclose a method wherein processing includes providing zero point parameters, saturation management parameters, field of view parameters or physical filter parameters.

16. It would have been obvious to further modify the method of Klausz such that it incorporated the aforementioned limitations. One would have been motivated to make such a modification so images are optimized for high quality display, wherein artifacts synonymous with the alteration between varying levels of radiation is minimized.

17. Claims 17 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klausz (U.S. Patent 4,633,494) in view of Boyer (U.S. Patent 5,295,200).



18.

[57]

**ABSTRACT**

A method and apparatus are provided for quickly determining misalignment between two images. Patient misalignment calculations can be performed on-line using Fourier correlation analysis to compare the location of a portal field of radiation with a previously stored portal reference field. Fourier comparisons are done in both hardware and software which rapidly computes misalignment of a patient relative to the portal field and can also rapidly reposition the patient with respect to that field.

19.

Figure 1 and Abstract - U.S. Patent 5,295,200 to Boyer

20. As per claims 17 and 30, Klausz as modified does not explicitly disclose a method wherein verifying includes automatic verification using a computer algorithm.

21. Boyer teaches a method comprising the use of a computer algorithm for determining the alignment of an object (see Fig. 1 and abstract, above).

22. It would have been obvious to further modify the method of Klausz such that it incorporated automatic verification of pre-shot images using a computer algorithm. One would have been motivated to make such a modification so that an operator is able to obtain ideal patient position information based on processor analysis of ideal settings or recognized image shifts. A benefit of such a modification is that patient positioning can be optimized based on algorithmic calculations for ideal image capture as taught by Boyer (Fig. 1 and abstract, above; see also column 5, lines 9-36).

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (703) 306-0473. The examiner can normally be reached on M - F (9 am - 5 pm).




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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305 3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

Courtney Thomas

March 17, 2003

  
ROBERT H. KIM  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800